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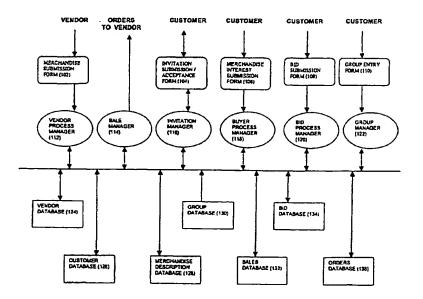
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(54) Title: METHOD AND SYSTEM FOR BUYER-INITIATED AGGREGATING OF BUYERS TO OBTAIN DESIRED PRODUCTS AT DISCOUNTED PRICES



#### (57) Abstract

A buyer-initiated process including posting the description of a product item of interest to a buyer and aggregating buyers who are interested in the same product or service. Vendors can then offer the desired product or service by posting the best price they can offer to the group of buyers. The preferred process creates direct competition between vendors who wish to win the business of the aggregated buyer group. Buyers benefit from obtaining the desired product at the best price available from all participating vendors.

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# METHOD AND SYSTEM FOR BUYER-INITIATED AGGREGATING OF BUYERS TO OBTAIN DESIRED PRODUCTS AT DISCOUNTED PRICES BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to electronic commerce and more particularly to the formation of online communities to initiate the purchasing of products that are generally not available in the marketplace at reasonable prices. Description of the Related Art

There are well-known and significant advantages available to buyers who

increase their purchasing power. Vendors offer bigger discounts and better customer service to high volume customers, and are more willing to make changes to their product offerings to suit high volume buyer demands. In the available art, this greater purchasing power rests with big corporations. Individuals and smaller corporations presently do not have access to a flexible,

multi-product mechanism providing the advantages afforded by high volume purchasing power.

 There are currently two possible ways for buyers to improve their negotiating position with vendors. One approach is to join a purchasing club such as Sam's Club or Costco. However, a buyer taking this approach to purchasing suffers significant disadvantages. First, the club does all the negotiation with the vendors – the buyer is not involved in the negotiating process. Also, the purchasing club decides what products may be of interest to their members and then negotiates with vendors for those products. In addition, buyers must pick only from a pre-selected list of products and have no convenient mechanism for changing or adding to the products available. Also, buyers have no direct influence over the prices they pay, and have no incentive to cooperate with other buyers to affect prices. Finally, available buying clubs provide no mechanism to create direct competition between vendors for buyer activity.

Another way for buyers to improve their negotiating position is by signing up with a buyer-initiated purchasing process, such as the one offered by

Internet-based companies such as Priceline.com, whose sales mechanism is described in U.S. Patent No. 5,794,207, incorporated herein by reference. Specifically, Priceline.com provides a means for an interested user to state the price he or she would be willing to pay for a particular product. There is no aggregation of purchasing power. Further, using Priceline.com, an interested user can pick only a few well-known and commonly available products and services.

#### **SUMMARY OF THE INVENTION**

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A preferred embodiment of the present invention comprises an automated system and method of buying, comprising: a) a Merchandise Interest Submission Form to obtain product information about a desired product from a first buyer; b) a Merchandise Submission Form to obtain sale information for the product from a first vendor; c) a Buyer Process Manager to store product information in a Merchandise Description Database; d) a Vendor Process Manager to store sale information in a Sale Database; and e) a Sale manager to match product information and sale information and generate orders for the product. Preferably, the system obtains offers from more than one vendor and then offers the buyers the best price. Also preferably, the system employs a Group Manager to aggregate buyers seeking the same product. Once a vendor is identified for a given product, the buyers in the corresponding group will automatically submit bids for the product. The system may also comprise a Bid Process Manager and Bid Submission Forms to allow additional buyers to place bids. The buyers may place and withdraw bids after the Start Time of the sale. After the Hold Time, only new bids and increased bids are allowed. Ideally, both the buyers and the vendor(s) communicate with the system via a wide area network such as the Internet. However, other means of submitting and receiving information from the system are possible including automated telephone systems or even direct input and output, such as keyboard, monitor and printer.

In another embodiment, the system comprises a) Buyer Process means for obtaining product information from a buyer about a product; b) Vendor Process means for obtaining sale information for the product from a vendor; and c) a

Sale means for matching product information and sale information and generate orders for the product. The invention also is a computer-implemented method comprising the steps of a) obtaining product information for a desired product from a buyer; b) obtaining sale information about the product from a vendor; c) storing and organizing the sale information; d) storing and organizing the product information; e) matching product information and sale information; and f) generating orders for the product. The method can also comprise the steps of grouping additional buyers based on interest for the same product or comparing the sale information from more than one vendor to find the best price or offering invitations to potential buyers. The invention also comprises computer-readable media having instructions for carrying out the above steps.

The present invention is a buyer initiated process where a buyer who desires a specific product that is either atypical, and hence currently unavailable in the marketplace, or is available at a price that he is unwilling to pay, can aggregate buyers who also want the same product. This aggregation of other potential buyers may be done by any number of ways including postal mail, advertisements, email, or using the Internet. This aggregation of buyers will result in an entity with a greater purchasing power than was possible by any of its members acting alone.

The group that has been formed to express an interest in buying a particular product attracts vendors who desire to offer the particular product to the group, thereby inducing price competition among the vendors who offer the product, to the group's benefit. These vendors may not have otherwise offered the product at those prices for various reasons. For example, they may not have been aware that such a product was desired or that there was sufficient demand for the product. With the formation of the group, however, the marketing cost to find buyers for the product has been reduced and hence some of those savings can now be passed on to the buying group.

It is therefore a first advantage of the present invention to provide an intermediary-free opportunity for buyers to negotiate with vendors while aggregating purchasing power

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It is a second advantage of the present invention is that any consumer can describe the product he would like, aggregate others with a similar interest, and engage in negotiating with potential vendors.

It is another advantage of the method and system of the present invention is that the purchasing group is temporarily formed to get the best possible price for a particular product of interest to the group, no matter how obscure or unusual the product might be.

Still another advantage of the method and system of the present invention is the provision of increased buyer choice and direct effect on product selection, direct buyer influence on the price paid for an item, the provision of incentive for buyers to cooperate in order to influence price, and the provision of a forum for active competition between vendors for a set of buyers committed to purchasing an item.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The aforementioned advantages of the invention, as well as additional advantages thereof, will be more fully understood as a result of a detailed description of a preferred embodiment when taken in conjunction with the accompanying drawings in which:

- FIG. 1 schematically illustrates the overall system of the present invention, including databases, processes, and data input/output forms;
- FIG. 2 is a flow chart illustrating the Buyer Process Manager of the present invention;
- FIG. 3 is a flow chart illustrating the Bid Process Manager of the present invention;
- FIG. 4 is a flow chart illustrating the Sale Manager of the present invention;
- FIG. 5 is a flow chart illustrating the Invitation Manager of the present invention;
- FIG. 6 is a flow chart illustrating the Group Process Manager of the present invention;

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FIG. 7 is a flow chart illustrating the Vendor Process Manager of the present invention.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that the detailed description is not intended to limit the invention to the particular forms disclosed. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

#### 10 DETAILED DESCRIPTION OF THE INVENTION

communication between one or more buyers and one or more vendors. The process is initiated by a buyer submitting information about a desired product. This information is communicated to vendors and to other potential buyers across a wide area computer network such as the Internet. Other buyers are then allowed, and alternatively invited, to submit bid information to join a group and express interest in the desired product so that the vendors can gauge the demand for the desired product. One or more vendors may then offer the desired product at a given price. The inventive system and method then automatically selects the vendor offering the lowest price. Once a vendor has submitted information about the offered product, it is assigned a "Start Time," a "Hold Time" and a "Close Time" and becomes a sale. After the Start Time, the group information is converted to bids for the product. Further, all buyers may place additional bids for the product. At the Close Time, any outstanding bids are processed and the product is sold at the price offered by the vendor. The Hold Time freezes the minimum bid for the offered product by requiring users who have an open bid at the Hold Time to honor that bid. After the Hold Time

The system and method of the present invention facilitates

users cannot withdraw or decrease their bids, although they may increase bids or add a new bid. Until the Hold Time, the user has complete freedom. Any

buyer can decide to increase the number of units bid for, introduce a new bid,

decrease the number of units bid for, or withdraw a bid completely.

As shown in FIG. 1, one embodiment of the invention comprises a computer system having a number of software modules including: Forms that allow the input of information from vendors and buyers; Databases that organize and store the buyer and vendor information; and Managers that process and communicate the information between the Forms and the Databases.

Specifically, the Forms comprise: Merchandise Submission Form 102, which allows vendors to submit information about offered products; Invitation Submission/Acceptance Form 104, which allows buyers to invite others to the system and invited buyers to accept the invitation; Merchandise Interest Submission Form 106, which allows buyers to submit information and thus request a product; Bid Submission Form 108, which allows a buyer to submit a bid for an offered product; and Group Entry Form 110, which allows buyers to express interest in a requested product.

The Managers process and control the flow of information from the Forms and Databases and comprise: Vendor Process Manager 112, which controls the products placed for sale by a vendor; Sale Manager 114, which controls the initiation and closing of sales; Invitation Manager 116, which controls the invitation of other buyers to join the bidding process for a particular product; Vendor Process Manager 118, which controls the products requested by buyers; Bid Process manager 120, which controls the buyers bids for an offered product; and Group Manager 122, which enables other buyers to join in and express interest in a requested product. Specific operations of the Managers are illustrated in FIGs. 2-7 and described below.

The Databases organize and store the product, vendor and bid information and comprise: Vendor Database 124, which stores information about all the participating vendors; Customer Database 126, which stores information about all the buyers registered to participate in online purchasing; Merchandise Description Database 128, which stores information about each product offered for sale; Group Database 130, which stores information about buyer demand for a requested product; Sales Database 132, which stores information about each sale that is known to the system; Bid Database 134, which stores bids

registered by buyers for each sale, and Orders Database 136, which stores orders at the consummation of a Sale.

The Buyer Process Manager 118 enables a user, preferably only a registered user, to post a description of the merchandise the user is interested in, in order to request a product. Once the product is requested, a group can begin forming, thereby aggregating other potential buyers with a similar interest. A flow chart illustrating the operation of Buyer Process Manager 118 is provided in FIGs. 2A and 2B.

FIG. 2A illustrates in flow-chart form the process triggered by a buyer submitting information for a requested product via Merchandise Interest Submission Form 106. At step 201, the system checks to see if the buyer is registered. Also at step 201, the buyer's identity is authenticated. Various methods of identifying a buyer, including reading his network address, are envisioned as part of the present invention, as will be understood by one having the normal skill in the art to which the present invention pertains. Preferably, the authentication process is automated. In step 202, the buyer submits identifying information and, if not yet registered, registers with the system. In step 203, Buyer Process Manager 118 processes information from Merchandise Interest Submission Form 106 to the system. Specifically, the information is checked for validity and completeness including determining whether the desired product is fully described so as not to be ambiguous when reviewed by potential vendors. Buyer Process Manager 118 also determines whether other buyers have already requested such a product. At step 204, the buyer is notified if there is a problem with the information and prompted for correction. The buyer is also notified if another buyer has already requested the same or similar product and the buyer is given the option to join the group for that product as described below. At step 205, the verified merchandise description is passed to Merchandise Description Database 124 and the price for the product set as "no current price" since no vendor has yet offered the product. Group Database 136 is updated at step 206 by creating a new record for the requested product so that other buyers express interest.

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As shown in FIG. 2B, information about the product is communicated to potential buyers at step 207, preferably by posting the information on the Internet or other wide area network. Finally, at step 208, the information is communicated about the requested product to vendors, also preferably via the Internet. The information could also be communicated through newspapers, email, telephone or other means.

FIGs. 3A and 3B are flow charts illustrating the operation of Bid Process Manager 120, allowing a prospective buyer to register interest in purchasing a requested product that has subsequently been offered for sale (as shown in FIG. 7) by placing a bid for the product. As shown in FIG. 3A, the prospective buyer is checked at step 301 to determine whether the buyer is registered with the system. This also includes any desired authentication steps to verify the customer's identity. Preferably, this could be accomplished using automated identification and authentication processes known to those skilled in the art. New customers are registered by submitting the requisite information in step 302. In step 303, the customer's instruction to place a new bid in the sale or to increase the number of units in an existing bid is processed if the sale is between the Start Time and the Close Time. Instructions to decrease a bid or withdraw it altogether are processed in step 304 by checking to see if the Hold Time for the sale has occurred. Step 305 returns an error message to the customer if it is after the Hold Time for the sale, informing the customer that the bid cannot be deleted or reduced. If the Hold Time has not occurred, step 306 deletes or reduces the customers bid accordingly and updates Bid Database 134. New or increased bids processed in step 303 are verified in step 307, including checking to see if the bid refers to the product offered in the sale, and if the quantity requested is currently available. Step 308 returns an error message if the bid is not validated in step 307. Conversely, as shown in FIG. 3B, validated bids are added to Bid Database 134 in step 309.

FIGs. 4A and 4B flow illustrate the operation of Sale Manager 114, which generally comprises the steps taken to initiate a new sale and the steps taken to close out a sale. Each sale stored in Sale Database 132 is in one of four

different states: New, Active, Hold and Closed. Once a vendor has offered a product in response to a buyer request, a new sale is added to the Sales Database 132 based on the information obtained through Merchandise Submission Form 102 to Vendor Process Manager 112 as described below. Sale Manager 114 controls the process by which a new sale becomes Active, Held, or Closed.

Specifically, FIG. 4A illustrates that at step 401, Sale Database 132 is queried for all new sales whose Start Time is at or after the current time. At step 402, such sales are marked as Active. In step 403, Active sales are communicated to prospective buyers, preferably through a wide area network such as the Internet. This includes getting the corresponding merchandise description information from Merchandise Description Database 128 and combining that with the sale information, formatting all of it appropriately, putting the final description through an approval process that may be automated, and then publishing the information on the web. At step 404, Sale Manager 114 queries Sale Database 132 for all Active sales with a Hold Time at or after the current time. Step 405 marks the appropriate sales as Held. Step 406 queries the Sale database for all Held sales with a Close Time that is at or after the current time and marks them as Closed in step 407 so that no increases or new bids will be accepted.

FIG. 4B shows the steps taken to close out a sale. At step 408, Closed sales are identified and, at step 409, Bid Database 134 is queried for all outstanding bids corresponding to the Closed sale. At step 410, the product vendor's information is obtained from the Vendor Database 124 and the price information is taken from Merchandise Description Database 128. A purchase order is constructed for each buyer whose bid remains outstanding at the end of the sale. The purchase order reflects the number of units bid for by the customer and the unit price given by the vendor. At step 411, the processed bids are deleted from Bid Database 134 and newly created purchase orders from step 410 are added to Orders Database 136. Finally, at step 412, the

processed sale is deleted from Sale Database 132 and step 413 returns to step 408 until all closed sales are processed.

A flow chart for the operation of Invitation Manager 116 in conjunction with Invitation Submission/Acceptance Form 104 is shown in FIG. 5. Generally, customers invite other users to join the system and bid on products. Since the invention is predicated on the aggregation of buying power, it is in the interests of the buyers to recruit as many new buyers as possible. Potential users wishing to accept the invitation use Invitation Manager 116 to do so. At step 501 the processes are routed to one of two paths: at steps 502-506 an invitation is sent from a current user to a prospective one, while at steps 507-509, a prospective user may accept an invitation.

At step 502, current users wishing to issue an invitation are first checked to determine whether they are registered. If not, they are registered and added to Customer Database 126 in step 503. At step 504, invitation validity is checked. The validity determination may be based upon whatever policies are desired for a particular implementation. For example, in one embodiment a customer must invite another user to a specific sale only, or no more than 5 users may be invited at any given time, or each customer must provide certain pieces of information about each user invited to join. At step 505 an error message is returned if the invitation is not validated by step 504. Valid invitations are formatted and then communicated to the desired prospective users in step 506. Suitable means of communication include email, fax, postal mail and the like. For example, the buyer who requests a product can send emails inviting others to express an interest, and the email could contain a uniform resource locator link so that the recipient can easily pull up the merchandise description information.

Invited users are checked at step 507 to determine whether they are in Customer Database 126. If the invitee is already a registered customer, then Invitation Manager 116 simply reminds the user. Alternatively, at step 508 the requisite information is obtained and the invitee is added to Customer Database

126 to register the user. Suitable identification of the invitor is added to the record of the invitee at step 509.

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FIG. 6 illustrates the steps taken by Group Manager 122 when a buyer joins a group to indicate demand for a requested product by submitting information via Group Entry Form 110. At step 601, the system checks whether the buyer is registered. This step also authenticates the buyer to verify the buyer's identity. This includes various ways of identifying a buyer including reading his network address, etc. At step 602, the buyer submits his information and registers himself with the system if the buyer is currently not registered with the system. At step 603, Group Manager 122 validates information from Group Entry Form 110 to determine which group in Group Database 130 the buyer wishes to join. The buyer also specifies the number of units of the product desired. At step 604, the buyer is notified whether there is a problem with the information and prompts correction. At step 605, Group Database 130 is updated to reflect the buyer's interest.

The flow charts of FIGs. 7A and 7B illustrate the steps taken by Vendor Process Manager 114 to obtain information from Merchandise Submission Form 102 about products offered by vendors in response to products requested by buyers. As shown in FIG. 7A, at step 701 vendor registration is checked vendor identity authenticated. At step 702, a previously unregistered vendor submits the necessary information. At step 703, Vendor Process Manager 114 processes information from Merchandise Submission Form 102 and forwards the processed information. Specifically, the submitted information is checked for validity and completeness, and at step 204 the vendor is prompted to alert the system of any errors. The vendor supplies the quantity of the product offered and the offer price. At step 705, correspondence of the offered product to a requested product in Group Database 130 is verified and at step 706 the vendor is prompted if there is no match. If a requested product is matched in step 705, the price quoted by the vendor is compared to the current price at step 707. If there is no current price, or if the price is equal or superior to the price given by another vendor, steps 709 through 716 are executed as shown in FIG. 7B. If

the offered price is not equal or superior to the current price, the vendor is notified in step 708 and allowed to set a lower price if desired.

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FIG. 7B illustrates the steps for updating the system once the vendor submits a valid offer price in step 707. At step 709, the current price for the product in the Merchandise Description Database 128 is set to the price offered by the vendor. Next, the system checks to see if a sale record already exists for the product in step 710. If Sale Database 132 includes a record for the product, the operation skips ahead to step 715. If not, a sale is created by steps 711 to 714. Specifically, at step 711 a sale record is created in Sale Database 132 and the sale is marked Active to indicate that the actual selling process is underway. In step 712, the Hold Time and the Close Time for the sale are set relative to the current time. Since the Sale becomes Active when the first valid vendor arrives, the user initiating the process cannot know exactly when to set the Hold Time and Close Time, both of which are therefore set relative to the Active Time. At step 713, all bids in Group Database 130 for the particular product are moved to Bid Database 134. Finally, at step 714, the merchandise description for the product is published. Alternatively, in step 715, where a sale record already exists Merchandise Description Database 128 is simply updated with the new price being offered by the current vendor. Step 716 follows either step 714 or 715 depending on whether a sale record existed, and the group members of the vendor's offered product are notified accordingly.

The present invention therefore provides a novel method and system for buyer-initiated aggregating of buyers to obtain desired products at discounted prices. Although the present invention has been shown and described with respect to preferred embodiments, various changes and modifications lie within the spirit and scope of the claimed invention. Thus, the corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims are intended to include any structure, material, or acts for performing the functions in combination with other elements as specifically claimed.

Claims

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AALIGE 13	S Claim	5U 15

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A computerized system for aggregating purchasing power comprising:

- a) a Merchandise Interest Submission Form to obtain product
   information about a desired product from a first buyer;
  - b) a Merchandise Submission Form to obtain sale information for the product from a first vendor;
  - c) a Buyer Process Manager to store product information in a Merchandise Description Database;
- d) a Vendor Process Manager to store sale information in a Sale
   Database; and
  - e) a Sale manager to match product information and sale information and generate orders for the product.
- The computerized system of claim 1, further comprising a Group
   Entry Form to obtain group bid information from a second buyer about the product and a Group Manager to store the group bid information in a Group
   Database.
  - 3. The computerized system of claim 1 further comprising an Invitation Manager to issue buying invitations to prospective buyers and accept buying invitations from prospective buyers.
  - 4. The computerized system of claim 3 further comprising an Invitation Submission/Acceptance Form to obtain information for the Invitation Manager.
- The computerized system of claim 2 further comprising a Bid
   Submission Form for obtaining bid information from a third buyer and a Bid
   Process Manager for storing the third buyer bid information in a Bid Database.
  - 6. The computerized system of claim 5, wherein the Bid Process Manager allows new bids, increased bids, decreased bids and withdrawn bids for the product between a Start Time and a Close Time.

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7. The computerized system of claim 6, wherein the Bid Process Manager prevents decreased bids and withdrawn bids after a Hold Time occurring between the Start Time and the Close Time.

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8. The computerized system of claim 1, wherein the Vendor Process Manager compares sale information from the first vendor and sale information from a second vendor and stores desired sale information in the Sale Database.

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9. The computerized system of claim 1, wherein the vendor and the buyer submit information to and receive information from the system by way of a wide area network.

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10 10. The computerized system of claim 9, wherein the wide area network comprises the internet.

11. The computerized system of claim 2, further comprising a Merchandise Description Database to store product information, a Vendor Database to store vendor information obtained from the Merchandise

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Submission Form, a Bid Submission Form for obtaining bid information from a third buyer, a Bid Process Manager for storing the third buyer bid information in a Bid Database, and an Invitation Manager to issue buying invitations to prospective buyers and accept buying invitations from prospective buyers.

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12. A computerized system for aggregating purchasing power20 comprising:

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a) Buyer Process means for obtaining product information about
 a desired product from a buyer;

b) Vendor Process means for obtaining sale information from a first vendor about the product; and

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 c) a Sale means for matching product information and sale information and generating orders for the product.

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13. The computerized system of claim 12, further comprising a Group means for obtaining group bid information from a second buyer about the product.

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14. The computerized system of claim 12, wherein the Sale means compares sale information from the first vendor to sale information from a second vendor.

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15. The computerized system of claim 13, further comprising a Bid
 5 Process means for obtaining bid information about the product from a third buyer.

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16. The computerized system of claim 12, further comprising an Invitation means for issuing invitations to a second buyer and accepting invitations from the second buyer.

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17. The computerized system of claim 13, further comprising a Bid Process means for obtaining bid information about the product from a third buyer, and an invitation means for issuing invitations to a potential buyer and accepting invitations from the potential buyer.

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18. The computerized system of claim 15, wherein the first buyersubmits information to and receives information from the internet.

19. A computer-implemented method for aggregating purchasing power comprising the steps of:

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 a) obtaining product information about a desired product from a buyer;

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b) obtaining sale information from a first vendor about the product; and

 matching product information and sale information and generating orders for the product.

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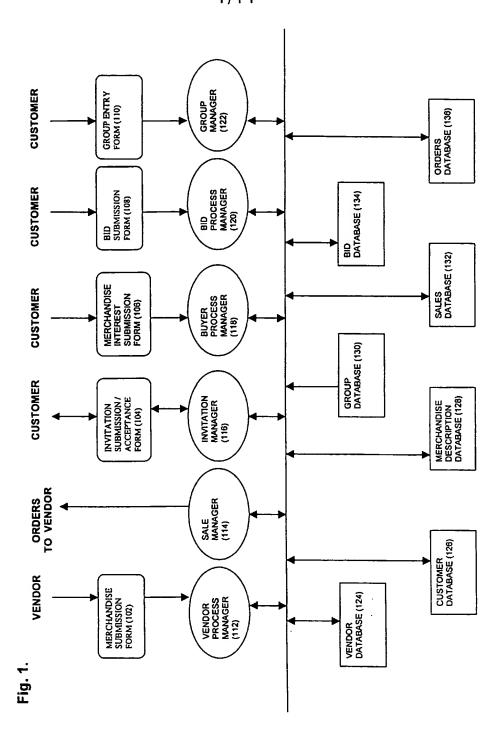
20. The method of claim 19, further comprising the step of obtaininggroup bid information from a second buyer about the product.

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21. The method of claim 19, further comprising the steps of obtaining sale information from a second vendor and comparing the sale information from the first vendor and the sale information from the second vendor.

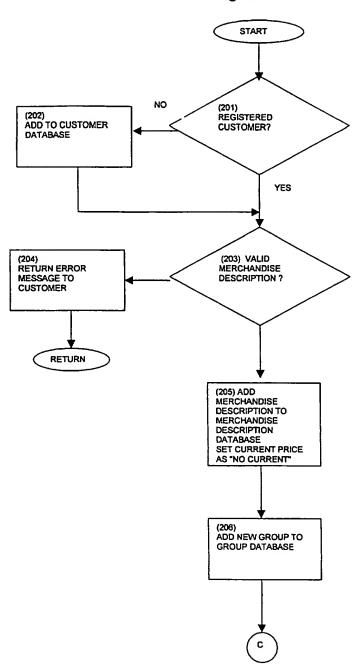
22. The method of claim 20, further comprising the step of obtaining30 bid information about the product from a third buyer.

5		23. The method of claim 19, further comprising the steps of issuing
		invitations to a second buyer and accepting invitations from the second buyer.
		24. The method of claim 20, further comprising the steps of obtaining
10		bid information about the product from a third buyer, issuing invitations to a
	5	potential buyer and accepting invitations from the potential buyer.
		25. A computer-readable medium containing instructions for controlling
15		a computer to aggregate purchasing power by:
		<ul> <li>a) obtaining product information about a desired product from a</li> </ul>
		buyer;
	10	b) obtaining sale information from a first vendor about the
20		product; and
		<ul> <li>storing and organizing the product information;</li> </ul>
		<li>d) storing and organizing the sale information;</li>
25		e) matching product information and sale information; and
	15	f) generating orders for the product.
		26. The computer-readable medium of claim 25, further comprising
30		instructions for obtaining group bid information from a second buyer about the
		product.
		27. The computer-readable medium of claim 25, further comprising
	20	instructions for obtaining sale information from a second vendor and comparing
35		the sale information from the first vendor and the sale information from the
		second vendor.
		28. The computer-readable medium of claim 26, further comprising
40		instructions for obtaining bid information about the product from a third buyer.
	25	29. The computer-readable medium of claim 25, further comprising
		instructions for issuing invitations to a second buyer and accepting invitations
45		from the second buyer.
		30. The computer-readable medium of claim 26, further comprising
	20	instructions for obtaining bid information about the product from a third buyer,
50	30	issuing invitations to a potential buyer and accepting invitations from the
		potential buyer.



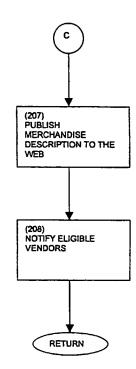
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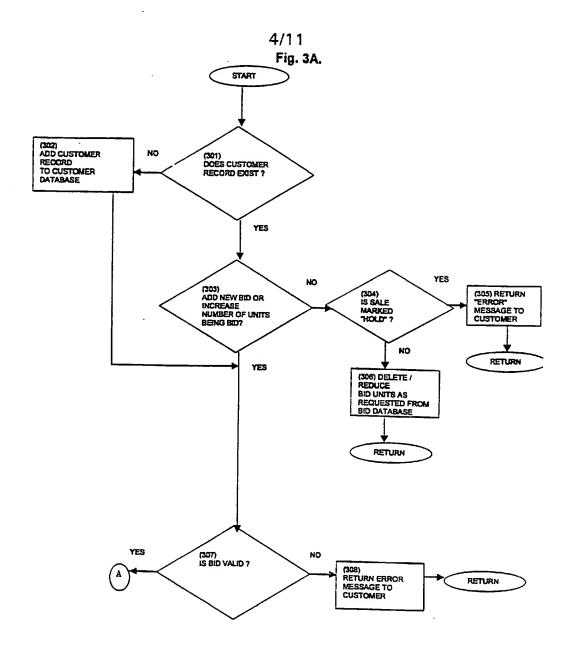
Fig. 2A.



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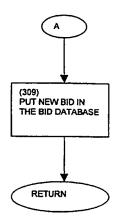
Fig. 2B.





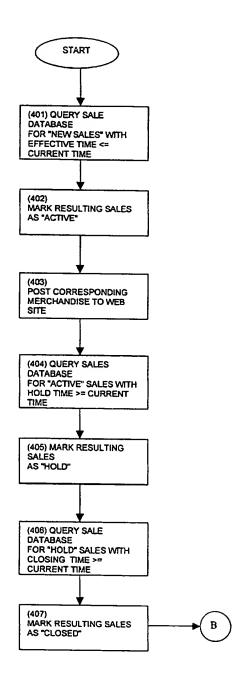
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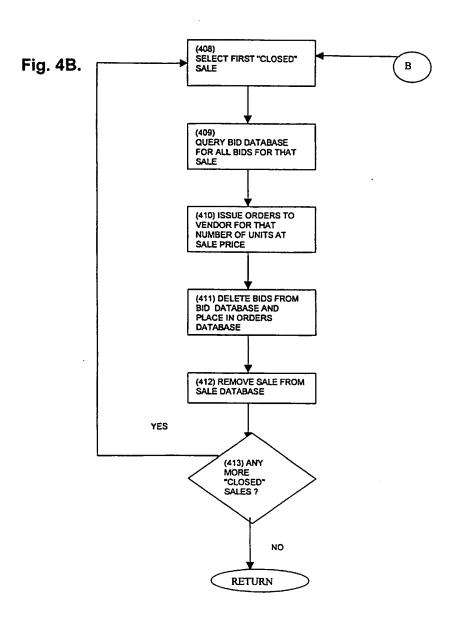
Fig. 3B.

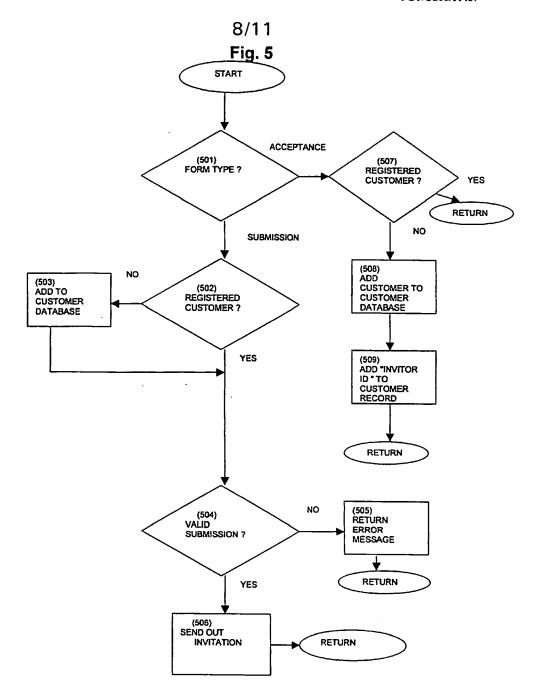


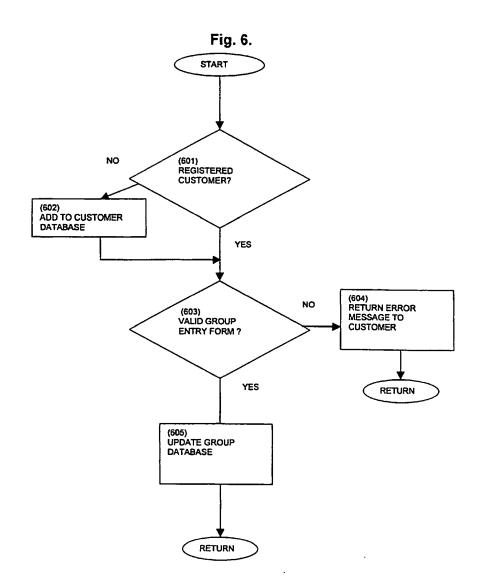
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Fig. 4A.

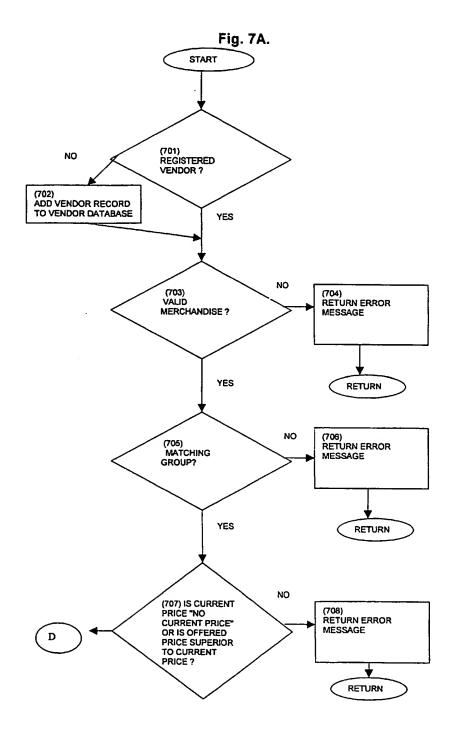




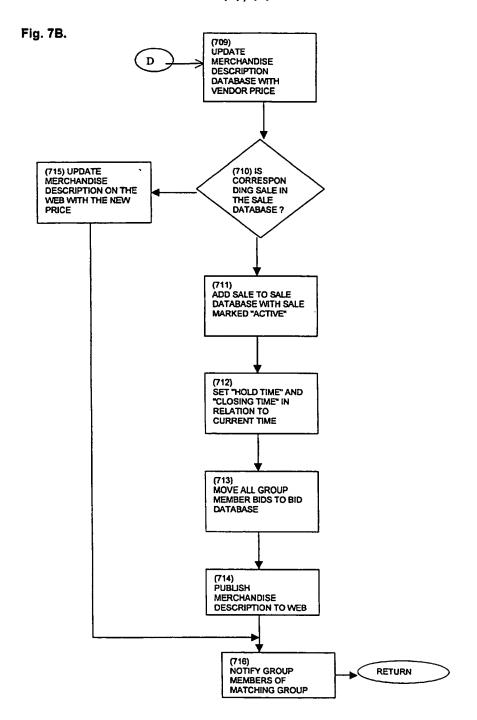




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